1 (currently amended). A system for thermal protection, the system comprising:

a cap, having at least one exposed surface and a cap interface surface spaced apart from the cap exposed surface, the cap having at least first and second spaced apart polygonal or curvilinear depressions and one or more pairs of spaced apart bosses at the cap interface surface, each boss pair defining a threaded buttress ~~thread~~ or keyway in the cap, the cap having a material composition including carbon and silicon;

an insulator base having an insulator base interface surface including at least first and second spaced apart polygonal or curvilinear projections, positioned to correspond to positions of the respective at least first and second spaced apart depressions in the cap interface surface and which compensate for a possible difference in thermal expansion between the cap and the insulator base at the insulator base interface surface, the insulator base having an insulator base second surface spaced apart from the insulator base interface surface, and having at least one insulator base aperture that extends from the insulator base interface surface to the insulator base second surface, the insulator base having a material composition including alumina and including at least one of silica, boron or other refractory material;

a transition region, having spaced apart first and second transition region surfaces, positioned between, and contiguous to, the cap interface surface at the first transition region surface and to the insulator base interface surface at the second transition region surface, having a thickness of about 1.2 mm or more, having a material composition comprising glass, a selected polymer and a selected mixture of $TaSi_2$, $MoSi_2$ and WSi_2, and having at least one transition region aperture at a location corresponding to the at least one insulator base aperture; and

at least one pin that extends through the at least one insulator base aperture and through the at least one transition region aperture, that has a plate or key at a first pin end that is received in the at least one threaded buttress or keyway, that is bonded to the cap at the first pin end, and that is bonded to the insulator base second surface at a second pin end, the pin having a material composition that is substantially the same as the material composition of the insulator base component.

2 (previously presented). The system of claim 1, wherein said material composition of said cap is chosen to withstand temperatures up to at least 3000 °F over a selected time interval.

3 (previously presented). The system of claim 1, wherein said material composition of said cap is chosen to withstand temperatures up to at least 3600 °F over a selected time interval.

4 (original). The system of claim 1, further comprising a cap surface layer positioned at said cap exposed surface of said cap, having a surface layer thickness in a selected range of about 1 – 2.5 mm, and having a material composition comprising a first selected fraction of tantalum disilicide, a second selected fraction of molybdenum disilicide, a third selected fraction of tungsten disilicide and a fourth selected fraction of glass, wherein the cap surface layer is subjected to a HETC treatment.

5 (original). The system of claim 4, wherein said cap surface layer is provided as a functionally gradient layer.

6 (original). The system of claim 4, wherein said first fraction, said second fraction and said fourth fraction have respective ranges 5-70 percent, 0-30 percent and 10-95 percent.

7 (previously presented). The system of claim 6, wherein said cap material is substantially all ROCCI.

8 (previously presented). The system of claim 4, wherein said glass in said cap coating material is substantially all borosilicate glass.

9 (previously presented). The system of claim 1, wherein said cap material is substantially all silicon carbide.

10 (previously presented). The system of claim 1, wherein said cap material is substantially all silicon-oxy-carbide.

11 (original). The system of claim 1, further comprising an insulator base surface layer, positioned at said insulator base interface surface, having a surface layer thickness in a selected range 1 – 2.5 mm, and having a material composition comprising a fifth selected fraction of tantalum disilicide, a sixth selected fraction of molybdenum disilicide, a seventh selected fraction of tungsten disilicide and an eighth selected fraction of glass, wherein the insulator base surface layer is subjected to a HETC treatment.

12 (original). The system of claim 11, wherein said insulator base surface layer is provided as a functionally gradient layer.

13 (original). The system of claim 11, wherein said fifth fraction, said sixth fraction and said eighth selected fractions have respective ranges 5-70 percent, 0-30 percent and 10-95 percent.

14 (previously presented). The system of claim 11, wherein said glass in said insulator base coating material is substantially all borosilicate glass.

15 (previously presented). The system of claim 1, wherein said insulator base material is substantially all TUFI.

16-23 (canceled)